

Development of Hybrid FLGR/ SNCR/SCR Advanced NO_x Control

Participant

TIAX, LLC (acquired the research contracts of
Arthur D. Little, Inc.)

Additional Team Members

Fuel Tech—equipment supplier

Location

To be determined

Technology

A hybrid of Fuel-Lean Gas Reburn/Selective Non-Catalytic Reduction, and Selective Catalytic Reduction

Plant Capacity/Production

To be determined

Coal

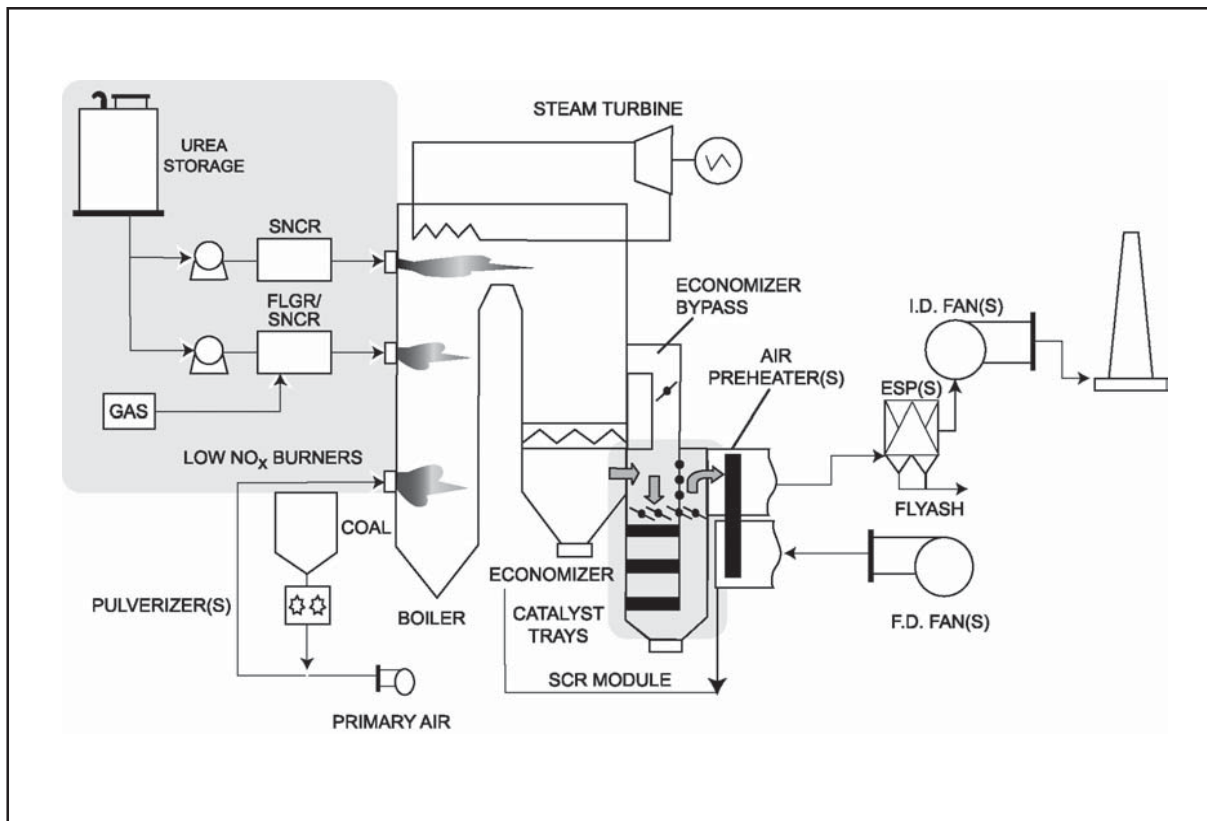
Eastern Bituminous Coal

Project Funding

Total	\$30,513,711	100%
DOE	14,957,658	49
Participant	15,556,053	51

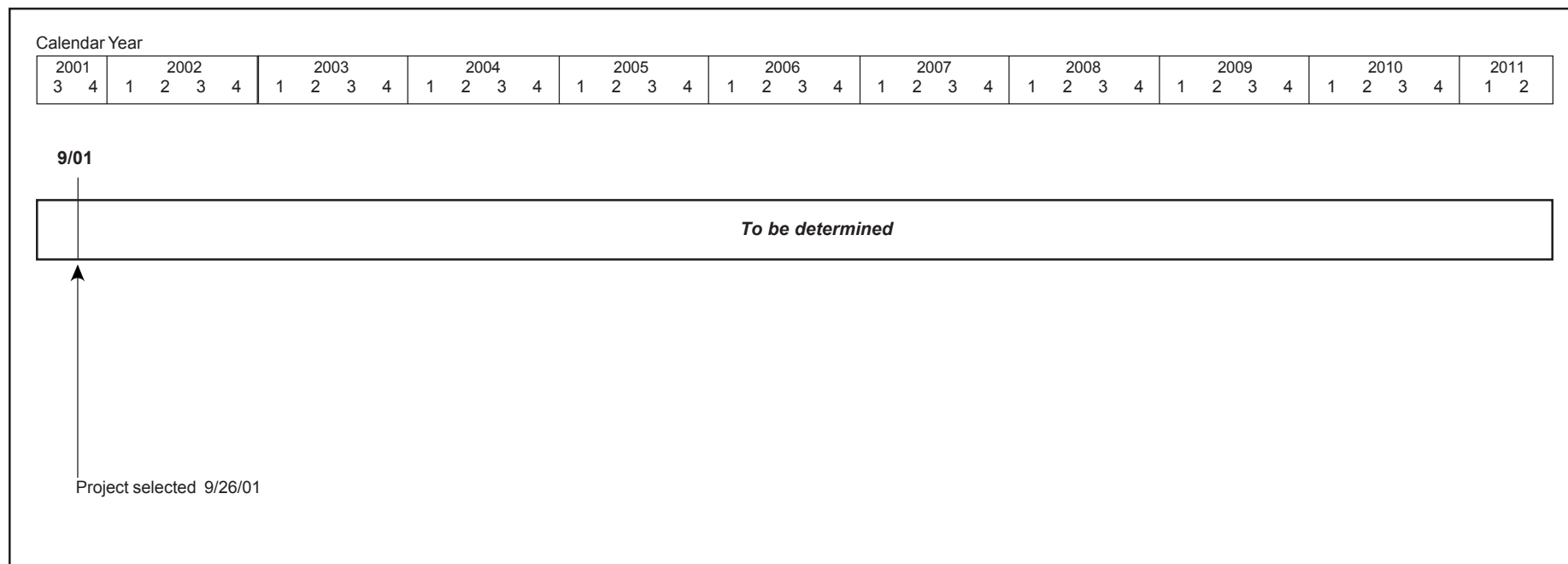
Project Objective

To develop and demonstrate a hybrid system composed of lower-cost components from three established NO_x-reduction systems that can function as stand-alone units or as an integrated, optimized, single-control system. Using Fuel-Lean Gas Reburn/Selective Non-Catalytic Reduction (FLGR/SNCR), Selective Non-Catalytic Reduction (SNCR), and Selective Catalytic Reduction (SCR) systems, the hybrid seeks to lower NO_x emissions to 0.15 lb/10⁶ Btu at lower costs than conventional SCR, a comparatively expensive, effective way to curb NO_x.



Technology/Project Description

The three components in the hybrid system are FLGR/SNCR, SNCR, and compact SCR. They have been developed individually, but have not been developed and optimized as a hybrid control system. The objectives of this project are to demonstrate the hybrid system as a lower cost alternative to SCR to achieve 0.15 lb/10⁶ Btu emission levels, and to operate the hybrid system to improve performance and reduce compliance costs to enhance operation in system-wide dispatch in the deregulated market.



Project Status/Accomplishments

The project was selected for award on September 26, 2001. Originally, Orion Power's Avon Lake Unit No. 9 near Cleveland, Ohio, was to be the host site. However, in February 2002, Orion Power was bought out by Reliant Energy, which decided in April 2002 not to pursue the project. TIAX, LLC, which acquired the research contracts of Arthur D. Little, Inc. (ADL) during ADL's bankruptcy proceedings in early 2002, has identified other potential sites and is proceeding to develop revised cost estimates. The schedule will be finalized when a new site is selected and the cooperative agreement is signed.

Commercial Applications

Coal-fired power boiler operators are facing a dual challenge to remain competitive while adapting to deregulation and to impending stringent NO_x controls. The NO_x control technologies available to coal-fired operators are not optimized for this new set of challenges. Under deregulation, the optimum control techniques need to have a low capital cost and cost-effective NO_x reduction over a wide operational range so that the performance of each unit in the system can be optimized to allow maximum

revenue dispatch. The increased flexibility is needed to allow each boiler and the integrated system to respond competitively to market conditions. Current reliance on selective catalytic reduction, with the associated high capital cost, will not typically give a utility sufficient dispatch flexibility to maximize competitiveness. Projections indicate that 30% of coal-fired boilers are going to be retrofitted with SCR. For the balance of units, power generators are looking for lower cost, more flexible means to design their units for competitive dispatch dictated by regional cost and environmental criteria.